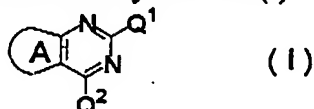


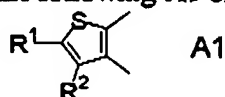
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Claims

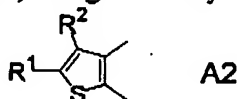
1. A herbicide comprising, as an active ingredient, a substituted thienopyrimidine derivative represented by formula (I):



wherein A represents the following A1 or A2:



wherein R¹ represents hydrogen or alkyl which may be substituted, and R² represents hydrogen, halogen or alkyl which may be substituted:



wherein R¹ and R² have the same meanings as described above,

Q¹ represents hydrogen, halogen, cyano, hydroxyl, carboxyl, or -X¹R³;

wherein X¹ is a single bond, -O-, -SO_n- in which n represents an integer of 0 to 2, -OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-, or -OC(O)-, and

R³ represents alkyl which may be substituted, alkenyl which may be substituted, alkynyl which may be substituted, amino which may be substituted, aryl which may be substituted, or a heterocyclic group which may be substituted,

Q² represents hydrogen, halogen, hydroxyl, or -X²R⁴,

wherein X² is a single bond, -O-, -SO_n- in which n has the same meaning as described above, -OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-, or -OC(O)-, and

R⁴ represents alkyl which may be substituted, alkenyl which may be substituted, alkynyl which may be substituted, amino which may be substituted, aryl which may be substituted, or a heterocyclic group which may be substituted, provided that following cases are excluded:

(1) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and Q² represents isopropyl or trifluoromethyl, a case where R³ represents 2-chlorophenyl, 2-chloro-6-fluorophenyl, 2,6-dichlorophenyl or 2,6-difluorophenyl is excluded,

(2) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents

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$-X^1R^3$ in which X^1 represents $-\text{CO}-$ and R^3 represents 2-chlorophenyl, a case where Q^2 represents hydroxyl, trifluoromethyl, methoxyl or methylthio is excluded,

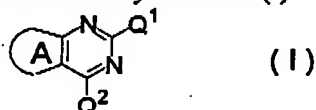
(3) in a case where A represents A1, R^1 and R^2 simultaneously represent hydrogen, Q^1 represents $-X^1R^3$ in which X^1 represents a single bond, and R^3 represents 2-chlorobenzyl, a case where Q^2 represents chlorine is excluded,

(4) in a case where A represents A2, R^1 and R^2 simultaneously represent hydrogen, Q^1 represents $-X^1R^3$ in which X^1 represents a single bond, and R^3 represents 2-chlorobenzyl, a case where Q^2 represents hydroxyl, methoxy, methylthio or methylamino is excluded,

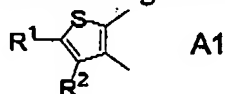
(5) in a case where A represents A2, R^1 and R^2 simultaneously represent hydrogen, Q^1 represents $-X^1R^3$ in which X^1 represents a single bond, and R^3 represents phenyl, a case where Q^2 represents hydroxyl is excluded,

(6) in a case where A represents A1, R^1 and R^2 simultaneously represent hydrogen, Q^1 represents $-X^1R^3$ in which X^1 represents $-\text{CO}-$, and R^3 represents 2-chlorophenyl, a case where Q^2 represents chlorine is excluded}”.

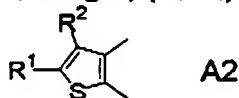
2. A herbicide comprising, as an active ingredient, a substituted thienopyrimidine derivative represented by formula (I):



wherein A represents the following A1 or A2:



wherein R^1 represents hydrogen, $(\text{C}_1\text{-C}_6)\text{alkyl}$, or $\text{halo}(\text{C}_1\text{-C}_6)\text{alkyl}$, and R^2 represents hydrogen, halogen, $(\text{C}_1\text{-C}_6)\text{alkyl}$, or $\text{halo}(\text{C}_1\text{-C}_6)\text{alkyl}$:



wherein R^1 and R^2 have the same meanings as described above,

Q^1 represents hydrogen, halogen, cyano, hydroxyl, carboxyl, or $-X^1R^3$;

wherein X^1 is a single bond, $-\text{O}-$, $-\text{SO}_n-$ in which n represents an integer of 0 to 2, $-\text{OSO}_n-$ in which n has the same meaning as described above, $-\text{CO}-$, $-\text{CO}_2-$, $-\text{OCO}_2-$, or $-\text{OC}(\text{O})-$, and

R^3 represents $(\text{C}_1\text{-C}_{10})\text{alkyl}$; $\text{halo}(\text{C}_1\text{-C}_{10})\text{alkyl}$; $\text{cyclo}(\text{C}_3\text{-C}_6)\text{alkyl}$; $\text{halocyclo}(\text{C}_3\text{-C}_6)\text{alkyl}$; $(\text{C}_1\text{-C}_6)\text{alkoxy}(\text{C}_1\text{-C}_6)\text{alkyl}$; $\text{halo}(\text{C}_1\text{-C}_6)\text{alkoxy}(\text{C}_1\text{-C}_6)\text{alkyl}$; $(\text{C}_1\text{-C}_4)\text{alkyl}(\text{C}_3\text{-C}_6)\text{cycloalkyl}$; $\text{cyclo}(\text{C}_3\text{-C}_6)\text{alkyl}(\text{C}_1\text{-C}_4)\text{alkyl}$; $(\text{C}_1\text{-C}_3)\text{alkoxycarbonyl}(\text{C}_1\text{-C}_4)\text{alkyl}$;

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C₃alkyl; (amino)hydroxy(C₂-C₆)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which dihaloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen atom, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

C₆alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

a heterocyclic group of which heterocycle is oxirane, oxetane, tetrahydrofuran, furan, thiophene, pyrrole, pyrrolidine, oxazole, oxazoline, oxazolidine, thiazole, thiazoline, thiazolidine, imidazole, imidazoline, imidazolidine, triazole, triazolidine, isoxazole, isoxazoline, isothiazole, isothiazolidine, pyrazole, pyrazoline, pyrazolidine, tetrazole, tetrahydropyran, pyridine, pyrimidine, pyridazine, morpholine, thiomorpholine, piperazine, piperidine, or oxazine;

a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy,

Q² represents hydrogen, halogen, hydroxyl, or -X²R⁴;

wherein X² represents a single bond, -O-, -SO_n- in which n has the same meaning as described above, -OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-, or -OC(O)-, and

R⁴ represents (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; halocyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkylcyclo(C₃-C₆)alkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which haloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting

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of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

a heterocyclic group of which heterocycle has the same meaning as described above; a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-

C₆alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy, provided that following cases are excluded:

(1) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and Q² represents isopropyl or trifluoromethyl, a case where R³ represents 2-chlorophenyl, 2-chlor-6-fluorophenyl, 2,6-dichlorophenyl or 2,6-difluorophenyl is excluded,

(2) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO- and R³ represents 2-chlorophenyl, a case where Q² represents hydroxyl, trifluoromethyl, methoxyl or methylthio is excluded,

(3) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents 2-chlorobenzyl, a case where Q² represents chlorine is excluded,

(4) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents 2-chlorobenzyl, a case where Q² represents hydroxyl, methoxy, methylthio or methylamino is excluded,

(5) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents phenyl, a case where Q² represents hydroxyl is excluded,

(6) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and R³ represents 2-chlorophenyl, a case where Q² represents chlorine is excluded).

3. The herbicide according to claim 1 or 2,

wherein Q¹ is OR³,

wherein R³ represents (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkyl(C₃-C₆)cycloalkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl;

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(amino)hydroxy(C₂-C₆)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which dihaloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

a heterocyclic group of which heterocycle is oxirane, oxetane, tetrahydrofuran, furan, thiophene, pyrrole, pyrrolidine, oxazole, oxazoline, oxazolidine, thiazole, thiazoline, thiazolidine, imidazole, imidazoline, imidazolidine, triazole, triazolidine, isoxazole, isoxazoline, isothiazole, isothiazolidine, pyrazole, pyrazoline, pyrazolidine, tetrazole, tetrahydropyran, pyridine, pyrimidine, pyridazine, morpholine, thiomorpholine, piperazine, piperidine, or oxazine;

a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, and halo(C₁-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, and halo(C₁-C₆)alkoxy.

4. The herbicide according to any one of claims 1 to 3,

wherein Q² is (C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; (C₁-C₆)alkylthio; cyclo(C₃-C₆)alkylthio; (C₁-C₆)alkylsulfinyl; cyclo(C₃-C₆)alkylsulfinyl; (C₁-C₆)alkylsulfonyl; cyclo(C₃-C₆)alkylsulfonyl;

a heterocyclic group of which heterocycle is oxirane, oxetane, tetrahydrofuran, furan, thiophene, pyrrole, pyrrolidine, oxazole, oxazoline, oxazolidine, thiazole, thiazoline, thiazolidine, imidazole, imidazoline, imidazolidine, triazole, triazolidine, isoxazole, isoxazoline, isothiazole, isothiazolidine, pyrazole, pyrazoline, pyrazolidine, tetrazole, tetrahydropyran, pyridine, pyrimidine, pyridazine, morpholine, thiomorpholine, piperazine, piperidine, or oxazine;

a substituted heterocyclic group of which heterocycle has the same meaning as described above, having, its on ring, one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

heterocyclic oxy of which heterocycle has the same meaning as described above; heterocyclic oxy of which heterocycle has the same meaning as described above, having, its on ring, one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio; or

-X²R⁴,

wherein X² is a single bond, -O-, -S-, -SO- or -SO₂-; and

R⁴ is phenyl which is substituted with one or more substituents which are the same or different and selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio and which is optionally substituted with one or more substituents which are the same or

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different and are selected from the group consisting of halogen, cyano, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, and halocyclo(C₃-C₆)alkylsulfonyl.

5. The herbicide according to claim 1 or 2,

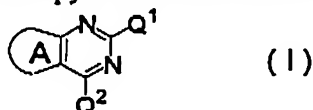
wherein Q¹ is hydrogen; halogen; cyano; hydroxyl; carboxyl; (C₁-C₁₀)alkyl; halo(C₁-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₁₀)alkoxy; halo(C₁-C₆)alkoxy; cyclo(C₃-C₆)alkoxy; halocyclo(C₃-C₆)alkoxy; (C₁-C₆)alkoxy(C₁-C₆)alkoxy; halo(C₁-C₆)alkoxy(C₁-C₆)alkoxy; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkoxy; (amino)hydroxy(C₂-C₆)alkoxy; (C₁-C₆)alkylthio(C₁-C₆)alkoxy; (C₁-C₆)alkylsulfinyl(C₁-C₆)alkoxy; (C₁-C₆)alkylsulfonyl(C₁-C₆)alkoxy; di(C₁-C₃)alkylamino(C₁-C₃)alkoxy of which alkyl moieties are the same or different; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; (C₂-C₆)alkenyloxy; halo(C₂-C₆)alkenyloxy; (C₂-C₆)alkynyloxy; amino; mono(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; substituted phenyl which is substituted with halo(C₁-C₃)alkyls which are the same or different; pyrrolyl; imidazolyl; substituted imidazolyl which is substituted with one or more (C₁-C₃)alkyl which are the same or different; pyrazolyl; substituted pyrazolyl which is substituted with one or more (C₁-C₃)alkyls or halo(C₁-C₃)alkyls which are the same or different; substituted pyrazolyl(C₁-C₃)alkyl which is substituted with one or more halo(C₁-C₃)alkyls which are the same or different; triazolyl; phenoxy; substituted phenoxy which is substituted with one or more substituents which are the same or different and are selected from the group consisting of halo(C₁-C₃)alkyl and halo(C₁-C₃)alkoxy; (C₁-C₃)alkylthio; (C₁-C₃)alkylsulfinyl; (C₁-C₃)alkylsulfonyl; (C₁-C₆)alkylsulfonyloxy; halo(C₁-C₆)alkylsulfonyloxy; phenylsulfonyloxy; substituted phenylsulfonyloxy which is substituted with one or more (C₁-C₃)alkyls which are the same or different; di(C₁-C₃)alkylaminosulfonyloxy of which alkyl moieties are the same or different; (C₂-C₄)alkenylsulfonyloxy; (C₁-C₃)alkylcarbonyloxy; (C₁-C₃)alkoxycarbonyloxy; (C₁-C₃)alkoxycarbonyl; aminocarbonyl; or substituted phenylaminocarbonyl which is substituted with one or more halogens which are the same or different,

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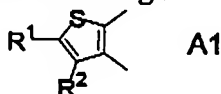
Q^2 represents halogen; hydroxyl; (C_1-C_6) alkyl; halo (C_1-C_6) alkyl; cyclo (C_3-C_6) alkyl; halocyclo (C_3-C_6) alkyl; (C_1-C_6) alkoxy; halo (C_1-C_6) alkoxy; (C_1-C_6) alkylthio; (C_1-C_6) alkylsulfinyl; (C_1-C_6) alkylsulfonyl; substituted phenyl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C_1-C_3) alkyl, halo (C_1-C_3) alkyl, (C_1-C_3) alkoxy, halo (C_1-C_3) alkoxy, and halo (C_1-C_3) alkylthio; substituted pyrazolyl having one or more substituents which are the same or different and are selected from the group consisting of halogen, (C_1-C_3) alkyl, and halo (C_1-C_3) alkyl; furyl; substituted thienyl which is substituted with one or more (C_1-C_3) alkyls which are the same or different; substituted pyridyl having one halogens which are the same or different; or substituted phenoxy having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C_1-C_3) alkyl, halo (C_1-C_3) alkyl, (C_1-C_3) alkoxy, halo (C_1-C_3) alkoxy, and halo (C_1-C_3) alkylthio.

6. A herbicidal method, which comprises carrying out a soil treatment, a field foliar treatment, or an irrigation treatment with an effective amount of the herbicide according to any one of claims 1 to 5.

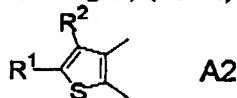
7. A substituted thienopyrimidine derivative represented by formula (I):



wherein A represents the following A1 or A2:



wherein R^1 represents hydrogen, (C_1-C_6) alkyl, or halo (C_1-C_6) alkyl, R^2 represents hydrogen, halogen, (C_1-C_6) alkyl, or halo (C_1-C_6) alkyl:



wherein R^1 and R^2 have the same meanings as described above,

Q^1 represents hydrogen, halogen, cyano, hydroxyl, carboxyl, or $-X^1R^3$,

wherein X^1 is a single bond, $-O-$, $-SO_n-$ in which n represents an integer of 0 to 2, $-OSO_n-$ in which n has the same meaning as described above, $-CO-$, $-CO_2-$, $-OCO_2-$, or $-OC(O)-$,

R^3 represents (C_1-C_{10}) alkyl; halo (C_1-C_{10}) alkyl; cyclo (C_3-C_6) alkyl; halocyclo (C_3-C_6) alkyl; (C_1-C_6) alkoxy (C_1-C_6) alkyl; halo (C_1-C_6) alkoxy (C_1-C_6) alkyl; $(C_1-$

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C₄)alkyl(C₃-C₆)cycloalkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (amino)hydroxy(C₂-C₆)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which haloalkyl moieties are the same or different; phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl,

C₆alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

a heterocyclic group of which heterocycle is oxirane, oxetane, tetrahydrofuran, furan, thiophene, pyrrole, pyrrolidine, oxazole, oxazoline, oxazolidine, thiazole, thiazoline, thiazolidine, imidazole, imidazoline, imidazolidine, triazole, triazolidine, isoxazole, isoxazoline, isothiazole, isothiazolidine, pyrazole, pyrazoline, pyrazolidine, tetrazole, tetrahydropyran, pyridine, pyrimidine, pyridazine, morpholine, thiomorpholine, piperazine, piperidine, or oxazine;

a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl, wherein the heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy,

Q² represents hydrogen, halogen, hydroxyl, or -X²R⁴;

wherein X² is a single bond, -O-, -SO_n- in which n has the same meaning as described above, -OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-, or -OC(O)-, and

R⁴ represents (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; halocyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkylcyclo(C₃-C₆)alkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which haloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting

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of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

a heterocyclic group of which heterocycle has the same meaning as described above; a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-

C₆alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy, provided that following cases are excluded:

(1) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and Q² represents isopropyl or trifluoromethyl, a case where R³ represents 2-chlorophenyl, 2-chlor-6-fluorophenyl, 2,6-dichlorophenyl or 2,6-difluorophenyl is excluded,

(2) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and R³ represents 2-chlorophenyl, a case where Q² represents hydroxyl, trifluoromethyl, methoxyl or methylthio is excluded,

(3) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents 2-chlorobenzyl, a case where Q² represents chlorine is excluded,

(4) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents 2-chlorobenzyl, a case where Q² represents hydroxyl, methoxy, methylthio or methylamino is excluded,

(5) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents a single bond, and R³ represents phenyl, a case where Q² represents hydroxyl is excluded,

(6) in a case where A represents A1, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -CO-, and R³ represents 2-chlorophenyl, a case where Q² represents chlorine is excluded,

(7) in a case where A represents A2, R¹ and R² simultaneously represent hydrogen, Q¹ represents -X¹R³ in which X¹ represents -S-, and R³ represents an ethyl group, a case where Q² represents a hydroxyl group is excluded,

(8) in a case where A represents A1, R¹ and R² simultaneously represent

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hydrogen, Q^1 represents $-X^1R^3$ in which X^1 represents a single bond, and R^3 represents 2-methylphenylamino, a case where Q^2 represents phenylamino or 2-methylphenylamino is excluded,

(9) in a case where A represents A1, R^1 represents ethyl, R^2 represents hydrogen, and Q^1 represents hydrogen, a case where Q^2 represents hydroxyl, chlorine, 4-bromophenylamino or 4-iodophenylamino is excluded,

(10) in a case where A represents A1, R^1 represents methyl, and R^2 represents methyl, a case where Q^1 and Q^2 simultaneously represent hydrogen is excluded,

(11) in a case where A represents A2, R^1 and R^2 simultaneously represent hydrogen, and Q^1 represents chlorine, a case where Q^2 represents chlorine is excluded,

(12) in a case where A represents A1, and Q^2 represents X^2R^4 in which X^2 represents a single bond, a case where R^4 represents amino, mono(C_1-C_6) alkylamino, di(C_1-C_6) alkylamino, phenylamino or substituted phenylamino is excluded,

(13) in a case where A represents A2, and Q^2 represents X^2R^4 in which X^2 represents a single bond, a case where R^4 represents phenyl, heterocyclic or substituted heterocyclic is excluded,

(14) in a case where A represents A2, and Q^2 represents X^2R^4 in which R^4 represents amino, mono(C_1-C_6) alkylamino, monohalo(C_1-C_6)alkylamino, di(C_1-C_6)alkylamino, dihalo(C_1-C_6)alkylamino, phenylamino or substituted phenylamino, a case where X^2 represents a single bond is excluded,

(15) in a case where A represents A2, and Q^2 represents X^2R^4 in which R^4 represents phenyl, substituted phenyl, heterocyclic or substituted heterocyclic, a case where X^2 represents $-CO-$ is excluded.}

8. The substituted thienopyrimidine derivative according to claim 7, wherein A represents A1,

Q^1 represents OR^3 , wherein R^3 has the same meaning as defined in claim 7,

Q^2 represents hydrogen, halogen, hydroxyl, or $-X^2R^4$,

wherein X^2 has the same meaning as defined in claim 7, and

R^4 is (C_1-C_{10})alkyl; halo(C_1-C_{10})alkyl; cyclo(C_3-C_6)alkyl; (C_1-C_6)alkoxy(C_1-C_6)alkyl; halo(C_1-C_6)alkoxy(C_1-C_6)alkyl; (C_1-C_4)alkylcyclo(C_3-C_6)alkyl; cyclo(C_3-C_6)alkyl(C_1-C_4)alkyl; (C_1-C_3)alkoxycarbonyl(C_1-C_3)alkyl; (C_1-C_4)alkylthio(C_1-C_4)alkyl; (C_1-C_4)alkylsulfinyl(C_1-C_4)alkyl; (C_1-C_4)alkylsulfonyl(C_1-C_4)alkyl; (C_2-C_6)alkenyl; halo(C_2-C_6)alkenyl; hydroxy(C_2-C_6)alkenyl; hydroxyhalo(C_2-C_6)alkenyl; phenyl(C_2-C_6)alkenyl; (C_2-C_6)alkynyl; halo(C_2-C_6)alkynyl; amino;

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mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which haloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

a heterocyclic ring of which heterocycle has the same meaning as defined in claim 7; a substituted heterocyclic ring of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, and halo(C₁-C₆)alkoxy, and

wherein

- (1) when X² is a single bond, R⁴ is not amino, mono(C₁-C₆)alkylamino or monohalo(C₁-C₆)alkylamino, and
- (2) when X² is -O-, R⁴ is not (C₁-C₁₀)alkyl.

9. The substituted thienopyrimidine derivative according to claim 7,

wherein A represents A1,

Q¹ represents hydrogen, halogen, cyano, hydroxyl, carboxyl, or -X¹R³;

wherein X¹ is a single bond, -SO_n- in which n represents an integer of 0 to 2, -OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-, or -OC(O)-;

R³ has the same meaning as defined in claim 7,

Q² represents substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted aryloxy having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylthio having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylsulfinyl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;
or

substituted arylsulfonyl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio,
and

wherein, when Q¹ is (C₁-C₆)alkyl in which X¹ is a single bond and R³ is (C₁-C₆)alkyl, Q² is not substituted aryloxy which is substituted with at least one fluorine-containing alkyl.

10. The substituted thienopyrimidine derivative according to claim 7,
wherein A represents A1,

Q¹ represents hydrogen; halogen; cyano; hydroxyl; carboxyl; (C₁-C₁₀)alkyl; halo(C₁-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₁₀)alkoxy; halo(C₁-C₆)alkoxy; cyclo(C₃-C₆)alkoxy; halocyclo(C₃-C₆)alkoxy; (C₁-C₆)alkoxy(C₁-C₆)alkoxy; halo(C₁-C₆)alkoxy(C₁-C₆)alkoxy; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkoxy; (amino)hydroxy(C₂-C₆)alkoxy; (C₁-C₆)alkylthio(C₁-C₆)alkoxy; (C₁-C₆)alkylsulfinyl(C₁-C₆)alkoxy; (C₁-C₆)alkylsulfonyl(C₁-C₆)alkoxy; di(C₁-C₃)alkylamino(C₁-C₃)alkoxy of which alkyl moieties are the same or different; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; (C₂-C₆)alkenyloxy; halo(C₂-C₆)alkenyloxy; (C₁-C₆)alkynyloxy; amino; mono(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; substituted phenyl which is substituted with one or more halo(C₁-C₃)alkyls which are the same or different; pyrrolyl; imidazolyl; substituted imidazolyl which is substituted with one or more (C₁-C₃)alkyls which are the same or different; pyrazolyl; substituted pyrazolyl having one or more substituents which are the same or different and are selected from (C₁-C₃)alkyl and halo(C₁-C₃)alkyl; substituted pyrazolyl(C₁-C₃)alkyl having one or more substituents which are the same or different and are selected from the group consisting of halo(C₁-

C₃)alkyl; triazolyl; phenoxy; substituted phenoxy having one or more substituents which are the same or different and are selected from the group consisting of halo(C₁-C₃)alkyl and halo(C₁-C₃)alkoxy; (C₁-C₃)alkylthio; (C₁-C₃)alkylsulfinyl; (C₁-C₃)alkylsulfonyl; (C₁-C₆)alkylsulfonyloxy; halo(C₁-C₆)alkylsulfonyloxy; phenylsulfonyloxy; substituted phenylsulfonyloxy having one or more substituents which is substituted with one or more (C₁-C₃)alkyls which are the same or different; di(C₁-C₃)alkylaminosulfonyloxy of which alkyl moieties are the same or different; (C₂-C₄)alkenylsulfonyloxy; (C₁-C₃)alkylcarbonyloxy; (C₁-C₃)alkoxycarbonyl; aminocarboxyl; substituted phenylaminocarbonyl which is substituted with one or more halogens on its ring which are the same or different,

Q² represents halogen; hydroxyl; (C₁-C₆)alkyl; halo(C₁-C₆)alkyl; cyclo(C₃-C₆)alkyl; halocyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy; halo(C₁-C₆)alkoxy; (C₁-C₆)alkylthio; (C₁-C₆)alkylsulfinyl; (C₁-C₆)alkylsulfonyl; substituted phenyl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, halo(C₁-C₃)alkoxy, and halo(C₁-C₃)alkylthio; substituted pyrazolyl having one or more substituents which are the same or different and are selected from the group consisting of halogen, (C₁-C₃)alkyl, and halo(C₁-C₃)alkyl; furyl; substituted thienyl substituted with one or more (C₁-C₃)alkyls which are the same or different; substituted pyridyl substituted with one or more halogens which are the same or different; or substituted phenoxy having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, halo(C₁-C₃)alkoxy, and halo(C₁-C₃)alkylthio.

11. The substituted thienopyrimidine derivative according to any one of claims 7, 9 and 10, wherein A represents A₁, and Q¹ represents halogen or hydroxyl.

12. The substituted thienopyrimidine derivative according to claim 7, wherein A is A₂,

Q¹ represents -OR³, wherein R³ has the same meaning as defined in claim 7,

Q² represents hydrogen, halogen, hydroxyl, or -X²R⁴,

wherein X² is a single bond, -O-, -SO_n- in which n represents an integer of 0 to 2, -OSO_n- in which n has the same meaning as described above, -CO₂-, -OCO₂-, or -OC(O)-;

R⁴ represents (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkylcyclo(C₃-C₆)alkyl;

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cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

phenylamino; substituted phenylamino which having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl which having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different, and

wherein, when X² is a single bond, R⁴ is not amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which alkyl moieties are the same or different; phenylamino; substituted phenylamino which has one or more substituents on its ring which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkyl(C₃-C₆)cycloalkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (C₁-

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C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; or (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl.

13. The substituted thienopyrimidine derivative according to claim 7,
wherein A is A2,

Q¹ represents halogen, cyano, carboxyl, or -X¹R³;

wherein X¹ is a single bond, -SO_n- in which n represents an integer of 0 to 2,
-OSO_n- in which n has the same meaning as described above, -CO-, -CO₂-, -OCO₂-,
or -OC(O)-, and

R³ has the same meaning as defined in claim 7, and

Q² represents:

substituted aryl having one or more substituents which are the same or
different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl,
fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted aryloxy having one or more substituents which are the same or
different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl,
fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylthio having one or more substituents which are the same or
different and are selected from the group consisting of fluorine-containing (C₁-
C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylsulfinyl having one or more substituents which are the same
or different and are selected from the group consisting of fluorine-containing (C₁-
C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;
or

substituted arylsulfonyl having one or more substituents which are the same
or different and are selected from the group consisting of fluorine-containing (C₁-
C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio.

14. The substituted thienopyrimidine derivative according to claim 7,
wherein A is A2,

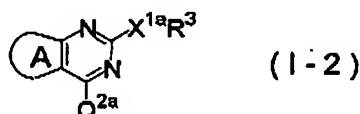
Q¹ represents halogen; cyano; carboxyl; (C₁-C₁₀)alkyl; halo(C₁-C₆)alkyl;
(C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₁₀)alkoxy; halo(C₁-
C₆)alkoxy; cyclo(C₃-C₆)alkoxy; halocyclo(C₃-C₆)alkoxy; (C₁-C₆)alkoxy(C₁-C₆)alkoxy;
halo(C₁-C₆)alkoxy(C₁-C₆)alkoxy; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkoxy;
hydroxyamino(C₁-C₃)alkoxy(C₁-C₃)alkoxy; (C₁-C₆)alkylthio(C₁-C₆)alkoxy; (C₁-
C₆)alkylsulfinyl(C₁-C₆)alkoxy; (C₁-C₆)alkylsulfonyl(C₁-C₆)alkoxy; di(C₁-

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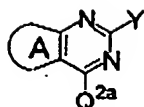
C₃alkylamino(C₁-C₃)alkoxy; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxyhalo(C₂-C₆)alkenyl; (C₂-C₆)alkenyloxy; halo(C₂-C₆)alkenyloxy; (C₂-C₆)alkynyloxy; amino; mono(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; substituted phenyl which is substituted with one or more halo(C₁-C₃)alkyls which are the same or different; pyrrolyl; imidazolyl; substituted imidazolyl which is substituted with one or more (C₁-C₃)alkyls which are the same or different; pyrazolyl; substituted pyrazolyl having one or more substituents which are the same or different and are selected from the group consisting of (C₁-C₃)alkyl and halo(C₁-C₃)alkyl; substituted pyrazolyl(C₁-C₃)alkyl which is substituted on its ring with one or more halo(C₁-C₃)alkyls which are the same or different; triazolyl; phenoxy; substituted phenoxy having one or more substituents which are the same or different and are selected from the group consisting of halo(C₁-C₃)alkyl and halo(C₁-C₃)alkoxy; (C₁-C₃)alkylthio; (C₁-C₃)alkylsulfinyl; (C₁-C₃)alkylsulfonyl; (C₁-C₃)alkylsulfonyloxy; halo(C₁-C₃)alkylsulfonyloxy; phenylsulfonyloxy; substituted phenylsulfonyloxy which is substituted with one or more (C₁-C₃)alkyls which are the same or different; di(C₁-C₃)alkylaminosulfonyloxy of which alkyl moieties are the same or different; (C₂-C₄)alkenylsulfonyloxy; (C₁-C₃)alkylcarbonyloxy; (C₁-C₃)alkoxycarbonyloxy; (C₁-C₃)alkoxycarbonyl; aminocarbonyl; or substituted phenylaminocarbonyl which is substituted with one or more halogens which are the same or different,

Q² is halogen; hydroxyl; (C₁-C₆)alkyl; halo(C₁-C₆)alkyl; cyclo(C₃-C₆)alkyl; halocyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy; halo(C₁-C₆)alkoxy; (C₁-C₆)alkylthio; (C₁-C₆)alkylsulfinyl; (C₁-C₆)alkylsulfonyl; substituted phenyl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, halo(C₁-C₃)alkoxy, and halo(C₁-C₃)alkylthio; or substituted phenoxy having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, halo(C₁-C₃)alkoxy, and halo(C₁-C₃)alkylthio.

15. A method for producing a substituted thienopyrimidine derivative represented by formula (I-2):

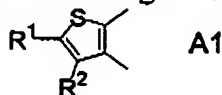


wherein A, R³, X^{1a} and Q^{2a} have the same meanings as described below; which comprises reacting a compound of formula (I-1):



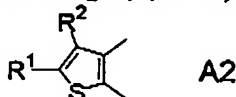
(I-1)

wherein A represents the following A1 or A2:



A1

wherein R¹ represents hydrogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl, and R² represents hydrogen, halogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl:



A2

wherein R¹ and R² have the same meanings as described above,

Y represents halogen,

Q^{2a} represents:

substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

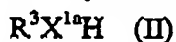
substituted aryloxy having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylthio having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylsulfinyl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

substituted arylsulfonyl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio;

with a compound represented by formula (II):



wherein X^{1a} is a single bond, -O-, or -S-,

R³ represents (C₁-C₁₀)alkyl; halo(C₁-C₁₀)alkyl; cyclo(C₃-C₆)alkyl; halocyclo(C₃-C₆)alkyl; (C₁-C₆)alkoxy(C₁-C₆)alkyl; halo(C₁-C₆)alkoxy(C₁-C₆)alkyl; (C₁-C₄)alkyl(C₃-C₆)cycloalkyl; cyclo(C₃-C₆)alkyl(C₁-C₄)alkyl; (C₁-C₃)alkoxycarbonyl(C₁-C₃)alkyl; (C₁-C₄)alkylthio(C₁-C₄)alkyl; (C₁-C₄)alkylsulfinyl(C₁-C₄)alkyl; (C₁-C₄)alkylsulfonyl(C₁-C₄)alkyl; (C₂-C₆)alkenyl; halo(C₂-C₆)alkenyl; hydroxy(C₂-

ANY OF WHICH
C₆alkenyl; hydroxyhalo(C₂-C₆)alkenyl; phenyl(C₂-C₆)alkenyl; (C₂-C₆)alkynyl; halo(C₂-C₆)alkynyl; amino; mono(C₁-C₆)alkylamino; monohalo(C₁-C₆)alkylamino; di(C₁-C₆)alkylamino of which alkyl moieties are the same or different; dihalo(C₁-C₆)alkylamino of which dihaloalkyl moieties are the same or different;

phenylamino; substituted phenylamino having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl; substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

aryl(C₁-C₆)alkyl; substituted aryl(C₁-C₆)alkyl having on its ring one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, hydroxyl, amino, SH, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₂-C₆)alkenyl, halo(C₂-C₆)alkenyl, (C₂-C₆)alkynyl, halo(C₂-C₆)alkynyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, halocyclo(C₃-C₆)alkoxy, (C₁-C₆)alkylthio, halo(C₁-C₆)alkylthio, cyclo(C₃-C₆)alkylthio, halocyclo(C₃-C₆)alkylthio, (C₁-C₆)alkylsulfinyl, halo(C₁-C₆)alkylsulfinyl, cyclo(C₃-C₆)alkylsulfinyl, halocyclo(C₃-C₆)alkylsulfinyl, (C₁-C₆)alkylsulfonyl, halo(C₁-C₆)alkylsulfonyl, cyclo(C₃-C₆)alkylsulfonyl, halocyclo(C₃-C₆)alkylsulfonyl, mono(C₁-C₆)alkylamino, and di(C₁-C₆)alkylamino of which alkyl moieties are the same or different;

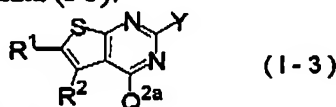
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a heterocyclic group of which heterocycle is oxirane, oxetane, tetrahydrofuran, furan, thiophene, pyrrole, pyrrolidine, oxazole, oxazoline, oxazolidine, thiazole, thiazoline, thiazolidine, imidazole, imidazoline, imidazolidine, triazole, triazolidine, isoxazole, isoxazoline, isothiazole, isothiazolidine, pyrazole, pyrazoline, pyrazolidine, tetrazole, tetrahydropyran, pyridine, pyrimidine, pyridazine, morpholine, thiomorpholine, piperazine, piperidine, or oxazine;

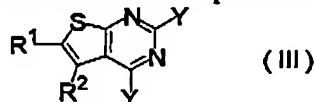
a substituted heterocyclic group of which heterocycle has the same meaning as described above, having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy;

heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above; or substituted heterocyclic (C₁-C₆)alkyl of which heterocycle has the same meaning as described above, having, on its ring, one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, cyclo(C₃-C₆)alkyl, halocyclo(C₃-C₆)alkyl, (C₁-C₆)alkylcarbonyloxy, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, cyclo(C₃-C₆)alkoxy, and halocyclo(C₃-C₆)alkoxy.

16. A process for producing a substituted thieno[2,3-d]pyrimidine derivative represented by formula (I-3):



wherein R¹, R², Q^{2a}, and Y have the same meanings as described below, which comprises carrying out a coupling reaction of 2,4-dihalogenothieno[2,3-d]pyrimidine derivative represented by formula(III):



wherein R¹ represents hydrogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl, R² represents hydrogen, halogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl, and Y represents halogen which are the same or different, with a compound represented by formula (IV):

Q^{2a}-L (IV)

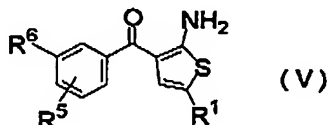
wherein Q^{2a} represents substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of fluorine-

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containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio, and

L represents a leaving group.

17. 2-Amino-3-(substituted benzoyl)thiophene derivative represented by formula (V):

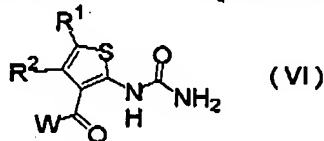


wherein R¹ represents hydrogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl,

R⁵ represents hydrogen, halogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl,

R⁶ represents fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, or fluorine-containing (C₁-C₆)alkylthio, wherein when R¹ is isopropyl and R⁵ is hydrogen, R⁶ is not trifluoromethyl.

18. A ureidethiophene derivative represented by formula (VI):

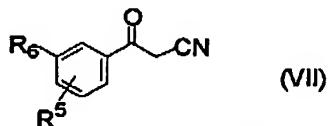


wherein R¹ represents hydrogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl,

R² represents hydrogen, halogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl, and

W represents aryl or substituted aryl having one or more substituents which are the same or different and are selected from the group consisting of halogen, cyano, nitro, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkoxy, and halo(C₁-C₆)alkylthio.

19. A substituted benzoylacetonitrile derivative represented by formula (VII):



wherein R⁵ represents hydrogen, halogen, (C₁-C₆)alkyl, or halo(C₁-C₆)alkyl,

R⁶ represents fluorine-containing (C₁-C₆)alkyl, fluorine-containing (C₁-C₆)alkoxy, and fluorine-containing (C₁-C₆)alkylthio,

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and wherein, when R^6 is fluorine-containing (C_1-C_6)alkyl, R^5 is not hydrogen and when R^6 is trifluoromethyl, R^5 is not fluorine, chlorine, methyl or trifluoromethyl.

20. 3-(Trifluoromethoxy)ethyl benzoate.

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